

DOI: 10.31520/2616-7107/2018.2.3-6

ISSN: 2616-7107

UDC 351.824.1

JEL: D82, G18, M11

**STATE REGULATION OF ENERGY SECURITY
IN NATIONAL ECONOMY****Viktor Koval**

Doctor of Economics, Associate
Professor,
Odessa Institute of Trade and
Economics of Kyiv National
University of Trade and Economics,
Odessa, Ukraine
E-mail: kafec@ukr.net
orcid.org/0000-0003-2562-4373

Received: September, 2018**Accepted:** October, 2018

DOI:10.31520/2616-7107/2018.2.3-6

Introduction. In the conditions of dependence on the imported energy resources there is a problem of ensuring stability of the energy industry with counteraction to changes of the ambient and a possibility of reacting to actions for providing competitive positions and advantages of the state. A number of problems in energy industry need a support of necessary level of the energy security on the basis of providing own extraction with volume reduction of imported energy resources, increasing of the national products' competitiveness in the world markets, development of innovations and investments into energy efficient technologies. In such conditions, it's important to apply actions for ensuring economic security of the energy sector through the creating of an efficient program for the protection of the national interests in the energy sector, which will contribute to the national economy development.

Aim and tasks. The purpose of article is a researching of energy security and developing actions for state regulation of energy security.

Research results. The article outlines the priority directions of the state policy on ensuring the energy sector development which are identified as a main risks and adverse factors of influence on functioning of energy industry of Ukraine. And the necessity of energy security systems formation at the state level is grounded. The perspective increasing directions of energy security are the establishment of more adapted to transformations system of state regulation with market self-regulation elements. The state regulation of energy security in conditions of high level internationalization of national economy should be aimed at the harmonization of its technological and institutional aspects which influence the development and implementation of energy technologies and projects related to renewable energy sources. The state regulation requires further active development of institutional conditions for use of alternative energy resources and energy saving based on renewable energy.

Conclusion. To provide energy security it is necessary to improve the complex program of its development which will involve wide use of state regulation methods as well as public-private partnership development so the support of the implementation of investment projects will be provided. The important aspect in development of energy engineering is ensuring its economic security which will allow to level possible threats of the industry and to provide requirements of fuel and energy complex and industry for a long term. Energy security should be directed towards increasing energy efficiency which will promote reducing imports and depending on the supply of energy resources by other countries. State regulation of energy security should ensure the rational use of the energy sector potential and stable functioning of the energetic supply system which includes: implementation of energy efficiency and energy saving policies; increase of investment in energy engineering; reduction of environmental impact and emissions.

Keywords: economic security, energy security, state regulation, national economy.

УДК 351.824.1

JEL: D82, G18, M11

Віктор Коваль

Доктор економічних наук,
доцент,

Одеський торговельно-
економічний інститут Київського
національного торговельно-
економічного університету,
Одеса, Україна

E-mail: kafec@ukr.net

orcid.org/0000-0003-2562-4373

Отримано: Вересень, 2018

Прийнято: Жовтень, 2018

DOI: 10.31520/2616-7107/2018.2.3-6

ДЕРЖАВНЕ РЕГУЛЮВАННЯ ЕНЕРГЕТИЧНОЇ БЕЗПЕКИ В НАЦІОНАЛЬНІЙ ЕКОНОМІЦІ

Проблема. В умовах залежності від імпортованих енергетичних ресурсів постає проблема забезпечення стабільності енергетичної галузі із протидією перманентним змінам зовнішнього середовища та можливості реагувати на заходи для забезпечення конкурентних позицій та переваг держави. Низка проблем у енергетичній галузі потребують підтримки необхідного рівня енергетичної безпеки на основі забезпечення власного видобутку із скороченням обсягів імпортованих енергетичних ресурсів, розвитку інновацій та інвестицій в енергоефективні технології. Важливим виступає застосування заходів щодо забезпечення економічної безпеки на основі створення ефективної програми захисту національних інтересів в енергетичній сфері.

Мета і завдання. Метою статті є дослідження енергетичної безпеки та розроблення заходів із державного регулювання енергетичної безпеки.

Результати. У статті наведено пріоритетні напрями державної політики щодо забезпечення розвитку енергетичної галузі. Визначені як основні ризики і несприятливі чинники впливу на функціонування енергетичної галузі України та обґрунтовано необхідність формування на державному рівні системи енергетичної безпеки. Перспективними напрямками підвищення енергетичної безпеки є встановлення більш адаптованої до трансформаційних перетворень системи державного регулювання з елементами ринкового саморегулювання. Державне регулювання енергетичної безпеки в умовах високого рівня інтернаціоналізації національної економіки повинно бути направлено на гармонізацію його технологічного і інституціонального аспектів, які впливають на розробку і впровадження енергетичних технологій та проектів, пов'язаних з поновлюваними джерелами енергії та використання альтернативних енергоресурсів та енергозбереження.

Висновки. Для забезпечення енергетичної безпеки потрібно удосконалювати комплексну програму її розвитку, яка передбачатиме широке використання методів державного регулювання, а також розвиток державно-приватного партнерства, що забезпечить підтримку реалізації інвестиційних проектів. Важливим аспектом у розвитку енергетики виступає забезпечення його економічної безпеки, що дозволить нівелювати можливі загрози галузі та забезпечити в довгостроковій перспективі потреби паливно-енергетичного комплексу та промисловості. Напрямом підвищення енергетичної безпеки має стати енергоефективність, що сприятиме зменшенню імпорту та залежності від постачання енергетичних ресурсів. Державне регулювання енергетичної безпеки має забезпечити раціональне використання потенціалу енергетичної галузі та стабільне функціонування системи енергопостачання, що передбачає: впровадження політики енергоефективності і енергозбереження; підвищення об'єму інвестицій в енергетику; зменшення екологічного впливу.

Ключові слова: економічна безпека, енергетична безпека державного регулювання, національна економіка.

Introduction. In conditions of increasing imports of energy resources from the European energy market and the gradual termination of trade and economic cooperation with some countries the national energy industry faced strategic challenges.

The basis of the stable energy industry is the counteraction to permanent changes in environment and the ability to respond to measures for ensuring the competitive positions and state benefits.

A number of energy sector problems require support of necessary energy security level based on providing own extraction with reduction of imported energy resources. In addition, energy security is negatively affected by weak competitiveness of national products in world markets, low labor productivity in the industry, insufficient level of innovations.

In such conditions, it is important to apply measures to ensure the economic security of the energy sector through the establishment of an effective program for protection of national interests in the energy sector which will contribute to the development of national economy.

Analysis of recent research. At various times, the issue of ensuring energy security was given attention in studies which provide a comprehensive picture of energy security. In context of energy markets liberalization the development problems of energetic supply system are successfully considered by the group of experts [1] who substantiated the interrelation between supply security and network regulation of energy systems which are mainly natural monopolies to ensure the security of energetic supply systems.

The research [2] examines the concept of resistant energy security in a social, economic and environmental context to achieve energy stability with the provision of uninterrupted energy services. The research of the ex post approach to industrial regulation of energy engineering was conducted in the paper [3] which gives an assessment of the potential risks about this approach to economic regulation.

In the research [4-7] the next problems are revealed: the researching of energy saving and efficiency, consideration of problems and development possibilities and implementation of alternative energy sources.

In addition, the problem of energy security ensuring requires deep processing. One of types of state energy security threats for now is degradation of the most important industries for national economy, in particular, the coal industry. In this regard, the state faces the task of creating an effective system of energy security which should be based on a program of its support and strategic development in the long-term perspective with due regard for the features of a world market situation.

Aim and tasks. The purpose of the article is to study energy security and to develop measures for state regulation of energy security.

Main results. The domination of the technological orientation of the economy and the use of energy resources acts as a compensator of the low natural resources level for most developed countries. Therefore, the transformation of the raw model of the economy into the strategic direction of technological development causes the strengthening of state regulation of all entities based on development of their energy potential, since the level of energy resources use affects energy security.

In modern conditions of the increasing risks of energy security threats are due to: firstly, the energy sector as a system-forming one determines the level of economic, social and political development of society and the state; the violation of energy security significantly influences national security of the economic and military industries.

In this regard, the coherence and balance of the state regulatory policy and energy policy become especially relevant in the context of ensuring a necessary level of economic security. However, using protectionist policies the main threats to national (energy) security may be: low investment of the energy sector of Ukraine in comparison with other countries; reduction of scientific industry potential.

Energy security should be implemented into the state economic security system in the process of solving of economic problems related to energy and financial dependence on international institutions. The development of energy industries considering its specific features acts as a national priority in the state energy security.

Energy security is one of the components of the Ukraine national security wholly so far as the energy industry is the basis of creation of material and technical supply of production. The energy sector as the component of industry occupies more than 20% of gross added value into its structure. The largest subcontractors in its structure are the electro-energetics and the fuel industry which are the key sectors of the country's

economy and concentrate more than 22% of the number of employees and 23% of the sold industrial products [8].

More than 34% in the structure of used fuel and energy resources was the share of natural gas, 30.1% - coal, 13.0% - petroleum products, 10.7% - coke and semi-coke and 11.9% - other types of fuel. Compared to 2016 there were some minor changes in the structure of fuel use: the part of petroleum products and other types of fuel increased by 1.1 percentage points, coke and semi-coke by 0.5 percentage points while the use of coal reduced by 1.7 percentage points [8].

In the energy balance of the country in 2017, the total supply of primary energy amounted to more than 100 million tons of petroleum equivalent.

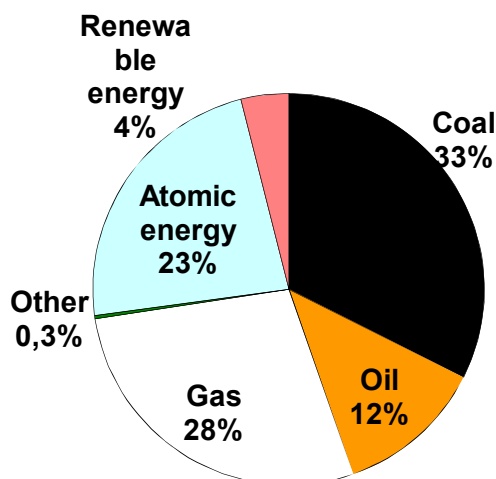


Fig.1. Distribution of energy sources in the total supply of primary energy

Source: State Statistics Service of Ukraine, 2018

In the structure of own production the largest share was: atomic energy – 23%, coal – 32% and natural gas – 28%. In the structure of renewable energy sources production biofuels and wastes occupied the most important part – 80%.

It should be noted that the Ukrainian energy system peculiarities are related to the high energy intensity of GDP which was 0.31 kg of petroleum equivalent in 2017 according to the Global Energy Statistical Yearbook 2017. In the interests of increasing the energy security level in strategic sectors, the institutional transformations should be linked to the development of the competitiveness of

domestic enterprises which mostly depend on the establishment of market mechanisms and institutes of ensuring national security.

Generally, the national economic security of energy industry is meant by its state as well as the capacity of the institutional system (through the decision of state authorities) to promote the implementation of mechanisms of leveling and counteracting possible threats (economic, information, technological) at the energy engineering markets (for example disproportion in the regional development of energy infrastructure and investments into appropriate energy saving technologies).

The state policy of energy security should be aimed at providing demand with energy carriers from own sources and reliable suppliers, counteracting possible threats (technogenic or political) to energy resources supply, increasing energy efficiency at the basic sectors of the national economy.

The perspective directions of increasing energy security are the establishment of system which is more adapted to the state transformations of regulation with elements of market self-regulation based on: strengthening the innovation orientation of developments at the energy sector; the introduction of reasonable restrictions of the transfer to operation of energy systems to the foreign enterprises.

The state regulation of energy security in conditions of high level internationalization of national economy should be aimed at harmonization of its technological and institutional aspects which affect the development and implementation of energy technologies and projects related to the renewable energy sources.

It requires the further active development of institutional conditions for the use of alternative energy resources and energy saving on the basis of renewable energy engineering.

Therefore, the strategic nature of the developing alternative energy sector through the institutional transformations should be performed by state regulation of energy security.

The limited development of alternative energy is evidenced by high capital cost and prime cost, and low capacity due to the stimulation and motivation of the business by the state to implement renewable energy engineering projects.

In addition, the institutional conditions of state ecological regulation do not contribute to the active transition to renewable energy engineering as there is a direct dependence on traditional energy sources at ensuring energy security ignoring the growing ecological problems caused by activities and emissions of traditional power stations.

The basis of state stimulation of developing renewable energy engineering is the creation of a favorable investment climate and an affective tax policy which is regulated by the norms of Ta Code and is characterized by the need for improvement of legal regulation.

The taxation of the energy sector affects the stability of economic situation and the functioning of the budget system as the part of filling the budget by energy sector companies is about 12-13% that characterizes the enterprises of energy sector as taxpayers and shows their public importance.

The urgency of the issue of the taxing energy companies is determined by the possibility of taxes to influence the developing economic security of energy sector through the reduction of the competitiveness of energy sector enterprises.

Table 1. The volume of taxes paid to the budget s by the largest enterprises of the fuel and energy complex, billion UAH

<i>Enterprises</i>	<i>2016</i>	<i>2017</i>
JSC "UkrGasVydobuvannya"	38,1	50,4
NJSC "Naftogaz of Ukraine"	16,1	11,5
PJSC "Ukrnafta"	8,2	10,4
PJSC "Transnational financial and industrial oil company "Ukrtatnafta"	5,5	8,7
NNEGC "Energoatom"	5,6	8,7
PJSC "Ukrtransgaz"	6,5	7,8

Source: State Statistics Service of Ukraine, 2018

Taxation as a fiscal factor of the activities of energy companies should be linked to fiscal measures of increasing the competitiveness of alternative energy sources which allows influencing energy security. However, reducing the tax load on the fuel and energy sector will generate a reduction of tax revenues and will not solve the problem of

ensuring energy security. Therefore, the main thing is to improve legislation on tax stimulation of investments in alternative energy engineering, for example through the tax credit or a reduction of property tax which may be a particularly important incentive for capital-intensive technologies and increase the demand for energy efficient equipment.

Table 2. The volume of investments in the fuel and energy complex, billion UAH

<i>Industries</i>	<i>2015</i>	<i>2016</i>	<i>2017</i>
Industry	84,17	108,64	136,49
Production of coke and oil refining products	0,67	0,73	0,91
Supply of electricity, gas, steam and air conditioning	21,04	29,89	29,00

Source: State Statistics Service of Ukraine, 2018

The main financing source of capital investments remains the own funds of enterprises at the energy sector which accounts for over 60% of the total volume.

The main factors influencing energy efficiency investments are state policy in the sphere of energy efficiency, development of industry and the construction sector, lowering the cost of technologies in the renewable energy sector.

In addition, the state is using measures to introduce green bonds in Ukraine as a tool

for attracting investments into energy efficiency and renewable energy engineering projects which will enable capitalization of enterprises and increase their investment prestige, and on the other hand will reduce emissions and improve industrial safety [9].

According to World Energy Investment 2018 the world's energy investment amounts to 1.8 trillion USD in 2017 including the largest sectors such as electricity and oil/gas with volumes of 750 and 716 billion dollars in accordance.

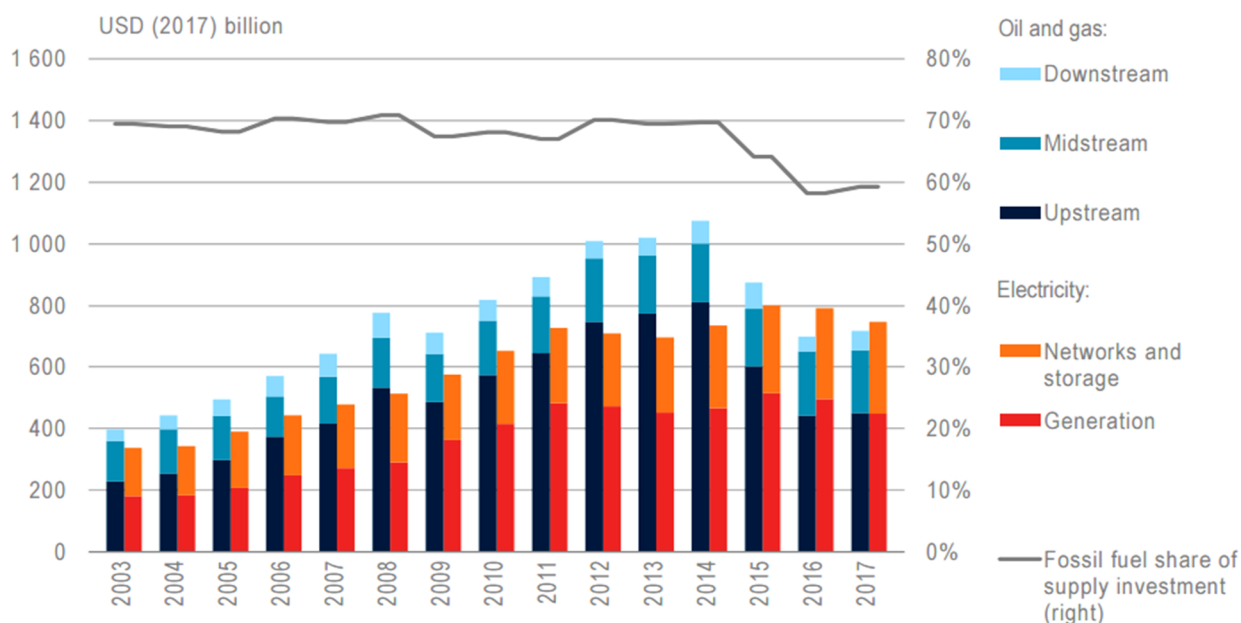


Fig 2. Energy investment 2003-2017

Source: World Energy Investment 2018

The volume of green bonds for financing energy efficient projects in Ukraine ranges between 40 billion and 70 billion dollars that can considerably exceed the value of bonds for renewable energy. To increase energy security the designated data will extend the capitalization of enterprises through the implementation of green projects, increasing their competitiveness and investment prestige. However, state regulation should be aimed at creating a regulatory framework for the forming introduction conditions of green bonds market in Ukraine creating additional conditions and guarantees for investments into energy projects. The national energy industry requires rapid and effective reform that is caused by need to improve energy policy, modernize equipment and technologies, and diversify fuel and energy resources. Among the most important internal problems of the energy sector the following negative phenomena are characterizes: significant reduction of industrial production volumes; insufficient level of investing production base development; low level of import substitution; a critically low level of technical re-equipment and a weak differentiation of sales markets [7].

The fuel and energy complex in Ukraine is operating in extremely difficult conditions due to the need to change supply sources because of the current political tension. It requires taking into account the reasonable risk of restricting access to the foreign market through politically motivated decisions by trading partners. Given it, there is a need to diversify imports and exports due to restrictions of continuing trade that on the one hand will reduce dependence on one market and risk but will lead to increasing costs through the transition to new standards.

Therefore, the question of the diversification of the import-export structure as a component of the economic security of the fuel and energy complex is critically raised. However, it should be noted that public relations which are related to the ensuring economic security and regulated by regulatory legal acts (laws) should be aimed

at supporting industries or markets. Such measures are balances state regulation and increasing the level of efficiency of industry management which involves the creation of competitive energy markets and transition to stimulating regulation, improvement of regulation, operational efficiency and transparency of operator's activity [8].

At the same time, it should be noted that the problems of organizational and legal ensuring of economic security at the energy sector of Ukraine become more important due to: imperfection of the institutional environment, transaction costs because of the state supervision (control) at economic activity; manifestations of concentration at the industries of the fuel and energy complex; insufficient level of social business responsibility, etc. [10]

For ensuring the development of energy security it is necessary to transform the institutional environment to improve state regulation as well as to optimize resource consumption by reducing the energy intensity of production of factor use.

Conclusions. In our opinion, to ensure energy security it is necessary to improve the comprehensive program of its development which will involve wide use of the state regulation methods as well as the development of public-private partnership that will support the implementation of investment projects. An important aspect of the energy engineering development is ensuring its economic security that will enable to level possible threats and provide needs of fuel and energy complex and industry for the long-term. The energy security should be directed towards increasing energy efficiency that will reduce imports and depend on the supply of energy resources by other countries. State regulation of energy security should ensure the rational use of the energy sector potential and stable functioning of the energy supply system which includes: implementation of energy efficiency and energy saving policies; increase of investment in energy engineering; reduction of environmental impact and emissions.

REFERENCES

1. Jamasb, Tooraj & Pollitt, Michael (2008). Security of supply and regulation of energy networks. *Energy Policy*. *Energy Policy*, 36, 4584-4589. 10.1016/j.enpol.2008.09.007.
2. Narula, Kapil (2019). Energy Security and Sustainability. The Maritime Dimension of Sustainable Energy Security, 3-22. 10.1007/978-981-13-1589-3_1.
3. Nagaj, Rafal (2017). Ex Post Regulation as the Method of Sectoral Regulation in Electricity Sector. *Journal of Economics and Management*, 30, 99-116. 10.22367/jem.2017.30.06.
4. Kalinichenko, O., Lesyuk, A. S. (2013). Energy Security of Ukraine. *Economy. Finances. Law*, 1, 3-6 [in Ukrainian].
5. Koriniev, V. L. (2012.). Problems of economic security of the sectors of the national economy at the present stage of their development. *State and regions*, 4, 44-48 [in Ukrainian].
6. Melnichenko, O.A. (2017). Energy security: the essence and means of state regulation. *Bulletin of the National University of Civil Protection of Ukraine*, 1, 32-41. [in Ukrainian].
7. Shevtsov, A.I., Zemlyanii, M.G., & Doroshkevich, A.Z. (2002). Energy Security of Ukraine: Strategy and Mechanisms of Provision. Dnipropetrovsk: Thresholds. [in Ukrainian].
8. Cabinet of the Ministers (2017). Order of the Cabinet of Ministers of Ukraine of August 18, 2017 No. 605-p on Approval of the Energy Strategy of Ukraine for the period up to 2035. Retrieved from <http://zakon2.rada.gov.ua/laws/show/605-2017-%D1%80> [in Ukrainian].
9. Bublyk, M., Koval, V. & Redkva, O. (2017). Analysis impact of the structural competition preconditions for ensuring economic security of the machine building complex. *Marketing and Management of Innovations*, 4, 229-240. doi: 10.21272/mmi.2017.4-20.
10. Koval, V., & Pukała, R. (2017). Implementation of regulatory policy in economic activity: development of the institute regulatory impact assessment. *Economics. Ecology. Socium*, 1(1), 24-32.

ЛІТЕРАТУРА

1. Jamasb, Tooraj & Pollitt, Michael. (2008). Security of supply and regulation of energy networks. *Energy Policy*. *Energy Policy*, 36, 4584-4589. 10.1016/j.enpol.2008.09.007.
2. Narula, Kapil. (2019). Energy Security and Sustainability. The Maritime Dimension of Sustainable Energy Security, 3-22. 10.1007/978-981-13-1589-3_1.
3. Nagaj, Rafal. (2017). Ex Post Regulation as the Method of Sectoral Regulation in Electricity Sector. *Journal of Economics and Management*, 30, 99-116. 10.22367/jem.2017.30.06.
4. Калініченко О. В., Лесюк А. С. Енергетична безпека України. *Економіка. Фінанси. Право*. 2013. № 1. С. 3–6.
5. Корінев В. Л. Проблеми економічної безпеки галузей вітчизняної економіки на сучасному етапі їх розвитку. *Держава та регіони. Серія: Економіка та підприємництво*. 2012. № 4. С. 44-48.
6. Мельниченко О. А. Енергетична безпека: сутність і засоби державного регулювання. *Вісник Національного університету цивільного захисту України. Серія : Державне управління*. 2017. Вип. 1. С. 32-41.
7. Шевцов А. І., Земляний М. Г., Дорошкевич А. З. Енергетична безпека України: стратегія та механізми забезпечення. Дніпропетровськ: Пороги, 2002. 264 с.
8. Енергетична стратегія України на період до 2035 року: схвалена розпорядженням КМУ 8 серпня 2017 р. № 605-р
9. Bublyk, M., Koval, V. & Redkva, O. (2017). Analysis impact of the structural competition preconditions for ensuring economic security of the machine building complex. *Marketing and Management of Innovations* vol. 4. pp. 229-240. doi: 10.21272/mmi.2017.4-20.
10. Koval, V., & Pukała, R. (2017). Implementation of regulatory policy in economic activity: development of the institute regulatory impact assessment. *Economics. Ecology. Socium*, 1(1), 24-32.